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actual recent experience only one policy has been warranted. But as to a policy to control in the future, further experience must be the guide. In any event, changes in rediscount

rates must be made well in advance of foreseeable changes in business activity, if the rates are to be used for the purpose they are commonly supposed to serve.

Theoretical Considerations Bearing on the Control of Bank Credit Under the Operation of the Federal Reserve System

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THE most important change in our banking machinery entailed by the Federal Reserve Act as bearing upon the question of the expansion and contraction of our circulating media is the introduction of compulsory bankers' banking. The essence of bankers' banking in the United States is the reserve dependence of the commercial banks upon the regional institutions. The deposits on the books of the regional banks are the reserves of the commercial banks. Inasmuch as the deposits of the regional banks are themselves expandible and contractile, the deposits of member banks, which would be elastic even if their reserve foundation were *inelastic*, now have an elasticity raised to the second power.

Moreover, the elasticity of both the deposits of the regional banks and of the members are buttressed and supported by the Federal Reserve note-issue provisions. Under the old national banking system an expansion of loans and a consequent expansion of deposits in the banking system was ordinarily accompanied by a rising physical volume of trade and rising prices. The growth in business transactions, coupled with higher prices, impelled men to carry more money in their pockets and merchants more

money in their tills. But the swelling of pocket and till money involved a withdrawal of cash from the commercial banks. As money left the banks, their lending power was curtailed, and expansion of credits and rising prices were brought to a halt.

Under the operation of the Federal Reserve Act an expansion of loans and a consequent expansion of deposits, accompanied by rising prices and expanding physical volume of trade, also impel men to carry more "money" in their pockets and merchants, more in their tills. Since 1914, however, the demand for additional pocket and till money has been met by the issue of *promises* of the Federal Reserve Banks to pay money. Lawful money is no longer lost by commercial banks. Instead it is held by the Federal Reserve Banks as a foundation on which is reared a three-fold credit structure: (1) deposits of Federal Reserve Banks; (2) deposits of member banks and (3) Federal Reserve notes.

The control of credit under our Federal Reserve System, therefore, becomes a matter of greater importance than under the old régime. Formerly an automatic check was imposed on credit expansion before extreme limits were reached. Today, in the absence of that automatic check,

we are to depend upon regulation of the rediscount rate as a chief means of control.

A MEMBER BANK CANNOT MAKE MANIFOLD LOANS

Now the effectiveness of the rediscount rate as an instrument of controlling bank loans and, therefore, deposits, hinges on the relation between the amount borrowed by a member bank and the amount that the same bank is able to lend as a result. If a member bank is able to lend five dollars on the basis of one dollar borrowed, it is evident that the borrowing bank would be willing and able ordinarily to pay more than 4 or 6 per cent for borrowed funds. On the other hand, if the borrowing bank is able to lend only dollar for dollar on the basis of borrowed funds, that bank will not ordinarily pay a higher rate of rediscount than it receives at its counter. What are the facts at this point?

It would at first appear that a borrowing bank would be able to make manifold loans on the basis of borrowed reserve. Does not the balance sheet of a typical national bank show loans (and deposits) equal to several times its reserve? If reserves of \$100,000 support loans of \$1,000,000 (and deposits of the same approximate amount), would not the acquisition of additional reserves of \$100,000 enable the bank to support total loans of \$2,000,000?

Normally, the bank that attempted to increase its loans by \$1,000,000 on the basis of \$100,000 new reserve would quickly be face to face with the problem of how to meet unfavorable clearing balances of large proportions. The borrowers of the \$1,000,000, leaving the proceeds of their loans on deposit, would draw checks against their bank balances for most of the \$1,000,000; those checks would be sent far and wide to creditors and, returning

to the bank in question, would be paid in cash or its equivalent. It is true that some of the checks drawn by borrowers would be sent to creditors who were depositors in the drawers' bank; in that event there would be no immediate corresponding loss of cash by the lending of the bank. It is also true that some borrowers would not withdraw all the funds borrowed. If due allowance is made for these two considerations, we may conclude that for every dollar that a typical American bank lends, it loses not less than eighty cents through direct cash withdrawals by borrowers and through unfavorable clearing balances.¹ In other words, the typical banker is able to lend approximately \$1.25 for each \$1.00 borrowed. It follows that rediscount rates roughly equal to the market rates (if the expense of carrying on the banking business is considered) will ordinarily be sufficiently high to serve as a check on borrowing by member banks.

BORROWED RESERVE SUPPORTS MANIFOLD LOANS IN THE BANKING SYSTEM

It may be added that borrowed reserve normally does become the foundation of manifold loans *in the banking system*. Bank A borrows \$100,000 from the Federal Reserve Bank and in turn lends \$125,000, more or less, to customers. The borrowing customers draw checks against their replenished balances and those checks are remitted to creditors. The creditors deposit the checks in their own banks. When the checks are cleared and collected, not only will the drawee bank lose approximately \$100,000 but other banks—banks B, we may say for

¹ For a more nearly accurate and more detailed statement see the writer's *Bank Credit*, The Macmillan Company, New York, 1921, Chapter III.

convenience—will have gained that amount in deposits, and a corresponding amount in reserve. The lending officers of banks B, mindful of the fact that a reserve must be held against the newly acquired deposit liabilities as well as against any deposits arising from additional loans made on the basis of the reserve freshly acquired, will be constrained to add to their loans not \$1.25 for each dollar deposited, but, approximately \$1.10.

If banks B now lend \$110,000 on the basis of \$100,000 newly lodged in those banks, they will *tend* to lose to other banks—banks C—approximately 80 per cent of the amount loaned, or \$88,000; the \$12,000 left in banks C, may be regarded as reserve against the \$100,000 in deposit liabilities growing out of the lodgment of that amount of checks drawn on bank A and against additional deposits growing out of the \$110,000 in loans. Banks C, having acquired \$88,000, are in a position to lend approximately \$96,800 (\$1.10 for each dollar of deposited reserve). If 80 per cent of their loans are lost to other banks, banks C would lose \$77,440 and retain \$10,560 ($\$88,000 - \$77,440$) as reserve against \$88,000 in deposit liabilities arising from the lodgment of that amount of checks drawn on banks B and against additional deposits growing out of the \$96,800 in loans.

This chain of operations continues until the original \$100,000 becomes very widely distributed and the total loan expansion results in deposits sufficient to cover or absorb the borrowed reserve.

CAN A BANK MAKE MANIFOLD LOANS DURING PERIOD OF LOAN EXPANSION?

At this point a crucial question arises. If all banks within a credit area were expanding their loans at the

same rate, would it not be possible for individual banks to make a several-fold loan expansion, consequent upon a reserve acquisition, without losing cash through unfavorable clearing balances, thereby rendering control of credit expansion possible only by raising the rate of rediscount unprecedentedly?

If the First National Bank of Dayton, Ohio, borrows \$100,000 from the Federal Reserve Bank of Cleveland at a time when other banks in the same credit area are likewise borrowing, and all expand their loans in such a manner that what each would normally lose in reserve is met and offset by streams of funds coming from other banks, the First National Bank of Dayton would be able to lend several dollars for each dollar borrowed, even if allowance is made for the likelihood that the proceeds of loans secured from the regional bank at Cleveland would be taken partly in Federal Reserve notes. Under these conditions, with the bank in question able to lend four or five dollars to each dollar borrowed, it has often been contended that a rate of rediscount that fell appreciably short of being four or five times the rate of discount or market rate would not be effective. That the contention is ill-founded may easily be shown.

When all banks in a given credit area are expanding their loans, the additional lending power of each is traceable to *two* quite different facts or forces. The first is the fund *borrowed* by the commercial or member bank, and the second is the fund or funds that such a bank receives through deposit channels and as a result of the lending operations of other banks. The point to be stressed is that what a member bank borrows does not determine the amount that it will receive in deposits that arise out of the lending operations of other banks. If within a

credit area where all member banks are borrowing and expanding their loans, one institution suddenly ceases to borrow, the stream of increasing deposits flowing from the expanding banks will tend to continue to swell the deposits and, therefore, the lending power of the bank that has ceased to borrow. A resumption of borrowing by the exceptional bank will enhance the lending power of that bank by an amount only slightly in excess of the amount borrowed.

A clear cut distinction must be drawn in banking between lending power that owes its existence to funds borrowed by a given bank and lending power that owes its existence to reserve acquired as a consequence of expanding loans on the part of *other* banks. When that distinction is clearly drawn the persistent contention referred to loses its semblance of validity.

Having seen on what grounds of sound theory the control of bank credit, *i.e.*, loans and deposits, rest, we may now be permitted briefly to examine the question whether the rediscount rate ought to be higher or lower than the market rate.

CONTROL OF BANK CREDIT THROUGH THE REDISCOUNT RATE

The rediscount policy of the Federal Reserve Board has gone counter to that of the great central banks of Europe, notably the Bank of England, the European policy having been to maintain the rediscount rate above the market rate.

Numerous guides have been followed by the directorate of the Bank of England in the determination of the bank rate: the reserve ratio, the state of trade, international gold movements and the market rate. Likewise, our Federal Reserve Board has also been governed by no single factor. While the state of trade, the reserve

ratio, the fiscal needs of the government, etc., have all received attention, the writer believes that too little effort has been made to bring the market rate into harmony with what may be called the *natural* rate of interest, the natural rate being the rate at which the supply of and demand for loanable capital goods, as distinct from "money," may be equated.

Although it is impossible always accurately to ascertain what the natural rate of interest is, it is not difficult to detect a wide disparity between the market and natural rates. The disparity between the market and the natural rates during the early period of credit expansion under the operation of the Federal Reserve Act, was due measurably to an inflationistic policy with a low rate of rediscount as its central feature. With a low rate of rediscount obtaining, our market rates were low and general prices rose in conjunction with an expansion of loans and deposits. Rising prices gave birth to rising profits, and the predictable increased demand for funds, with a consequent extreme rise in the market rate of interest, was soon in evidence. In a country like the United States where capital is highly productive and preference for present goods over future is pronounced, cheap money can be had only by making everything else dear; depression of interest rates engenders credit expansion and rising prices. Indeed, the price level is itself an index of the relation of the market to the natural rate when allowance is made for the changing phases of the business cycle.

Our extreme and recurrent expansion and contraction in industry and trade can be avoided, not by keeping the rate of rediscount invariably above the market rate, but by keeping it distinctly above the market rate during periods of expansion and less markedly so, or

even below the market rate, during periods of crisis and depression. Let the brakes of high rediscount rates be set early, long before the bottom of the hill is reached; and let the accelerating

force of low rates be applied with similar promptness and decision. If the market rate is kept in harmony with the natural rate, violent changes in the general price level can scarcely occur.

Agricultural and Commercial Loans

A Comparison of Loans Made in a Great Agricultural State with Loans to the Largest Bank and to Member Banks in the Largest City in the Seventh Federal Reserve District

By J. B. McDUGAL

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IT would be too much to expect the general public to have more than a casual comprehension of banking or of the relations of the Federal Reserve Banks to other banks or to business. It is not expected that the public will understand the operations of a factory which makes electrical machinery or of the electrical machines that are made. Still any well informed man may know in a general way what a dynamo is and have a grasp of what is meant by horse power. So might he know that a bank in a great central city probably generates a large horse power in credit and that comparison of the operations of such a bank with those of any smaller bank can be valuable or informative only if relative size is considered.

In this country there are banks of all kinds and sizes. The customary method of grading banks is by "capital and surplus," and "deposits." It takes 40 banks with \$25,000 capital each to measure up in capitalization to one with \$1,000,000. It takes 400 such banks to equal a \$10,000,000 institution. If the comparative figures are carried far enough, and total resources are used as the basis, it will be found that there are single banks in New York and Chicago with resources

larger than the combined resources of all member banks in certain individual states or perhaps in several states.

These large banks have as customers many small banks, as well as individuals and corporations. When borrowing from the Federal Reserve Banks, their transactions are usually in large amounts. It is natural that what is considered moderate borrowing for a large bank should appear extravagant when compared with the amount borrowed by a small bank. A loan of fifty million dollars appears very large when compared with one of fifty thousand. Relatively, however, fifty millions may be much more moderate than fifty thousand, if due consideration is given the respective reserve balances maintained with the Federal Reserve Bank by the institutions involved.

For instance, an officer of a country bank called at the Reserve Bank one day and asked for an additional loan. At the time his bank had become so extended that its excessive borrowings had been the subject of considerable correspondence. He was told that a definite limit must be placed on his borrowings at a point not far from the amount already borrowed. The country banker was piqued. He called at-